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## Are alien plants a pool for new eco-friendly “weapons” against lesser grain borer (*Rhyzopertha dominica*)?

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**Abstract:** Lesser grain borer *Rhyzopertha dominica* (Coleoptera Bostrichidae) represents one of economically most important primary storage pests with a large commodity scale (wheat, peanuts, corn, legumes). Today, it is confirmed that this pest has developed resistance to a number of frequently used pesticides. This is why numerous studies on the efficacy of botanical (plant-derived) products and plant secondary metabolites are constantly increasing.

Plants represent a great potential to be used as an environmentally friendly and highly efficient insecticides. The aim of this work was to determine the biological activity of three widespread invasive species in the city of Čačak: *Ailantus altissima* (Tree of heaven), *Portulaca oleracea* (Common purslane, little hogweed, or pursley) and *Ambrosia artemisiifolia* (Common ragweed, annual ragweed, low ragweed) on the laboratory population *R. dominica*.

Experiment was carried out in three steps: i) preparation of crude ethanol plant extracts of *A. altissima*, *P. oleracea* and *A. artemisiifolia* and 0.1, 1 and 5 % solutions; ii) contact and contact-digestive toxicity tests on wheat and maize kernels (whole and broken kernel) (Obeng-Ofori and Reichmuth, 1997) and iii) inhalation effects on adults of *R. dominica* in the test tubes (Stefanazzi et al., 2010).

According to obtained results, the highest inhalation effect of all three plant extracts on *R. dominica* adults (17.66 %) was achieved by 5 % solution of *A. altissima*. However, this efficacy is of little significance.

The highest contact efficacy (68.33 %) on *R. dominica* adults was registered in application of *P. oleracea* 5 %. These results indicate significant insecticidal potential of this invasive plant.

The results from contact – digestive tests of all three plant extracts on *R. dominica* adults indicate:

- on whole and broken maize kernels, the highest level of efficiency (13.33 % and 17.66 %) was registered for 0.1 % and 5 % solution of *A. altissima*, respectively
- on wheat kernels, the highest level of efficacy (35.33 %) was for 5 % solution *P. oleracea*.

The results indicate that contact efficacy of *P. oleracea* 5 % solution could be a satisfying “weapon” for small family or organic farms to control lesser grain borer. However, other extracts did not express satisfactory efficacy. Also, some obstacles in application of botanical insecticides can be removed by further planned research. Additional experiments will be carried out to identify possible influence of crude *P. oleracea* extract on bakery properties for wheat and bad smelt on maize as feed ingredient.

**Key words:** *Rhyzopertha dominica*, tree of heaven, *Portulaca oleracea*, common ragweed, contact effect

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